

IN THE CLAIMS:

Please amend the claim as follows:

1. (Original) A gain-clamped semiconductor optical amplifier having a horizontal lasing structure, the gain-clamped semiconductor optical amplifier comprising:

a gain layer for amplifying an optical signal;

a Bragg lattice layer formed on both sides of the gain layer along a longitudinal direction of the gain layer, said Bragg layer enabling light having a corresponding wavelength to resonate in a direction vertical to a longitudinal direction of the gain layer;

a passive light waveguide layer for restraining light resonating between lattices of the Bragg lattice layer;

an electrode for supplying current to the gain layer; and

a current-blocking layer for preventing current from flowing to an area other than the gain layer.

2. (Original) The gain-clamped semiconductor optical amplifier as claimed in claim 1, wherein the passive light waveguide layer is formed above the Bragg lattice layer.

3. (Original) The gain-clamped semiconductor optical amplifier as claimed in claim 1, wherein the passive light waveguide layer is formed below the Bragg lattice layer.

4. (Original) The gain-clamped semiconductor optical amplifier as claimed in claim 1, further comprising a phase conversion area formed at one side of the Bragg lattice layer.

5. (Original) The gain-clamped semiconductor optical amplifier as claimed in claim 1, wherein the phase conversion area is adjusted by omitting a predetermined portion of the Bragg lattices from the Bragg layer.

6. (Original) The gain-clamped semiconductor optical amplifier as claimed in claim 4, further comprising a phase conversion electrode for supplying current to the phase conversion area.

7. (Original) The gain-clamped semiconductor optical amplifier as claimed in claim 5, further comprising a phase conversion electrode for supplying current to the phase conversion area.

8. (Original) The gain-clamped semiconductor optical amplifier as claimed in claim 1, wherein the gain-clamped semiconductor optical amplifier includes a ridge type gain-clamped semiconductor optical amplifier.

9. (Original) The gain-clamped semiconductor optical amplifier as claimed in claim 1, wherein the gain-clamped semiconductor optical amplifier has a buried hetero-structure.

10. (Withdrawn) A method for manufacturing a gain-clamped semiconductor optical amplifier having a horizontal lasing structure, the method comprising the steps of:

- a) forming a Bragg lattice layer on a first conductive semiconductor substrate other than on a predetermined gain layer forming area;
- b) forming a first conductive lower clad layer, a light waveguide layer, and a first conductive upper clad layer on the first conductive semiconductor substrate having the Bragg lattice layer thereon;
- c) forming a gain layer and a second conductive clad layer on the first conductive upper clad layer of the predetermined gain layer forming area;
- d) forming a current-blocking layer on a predetermined area of the first conductive upper clad layer, on which the gain layer is not formed; and
- e) forming an electrode above the second conductive clad layer and a predetermined area of the first conductive upper clad layer, on which the current-blocking layer is not formed, in such a manner that the electrode surrounds the gain layer.

11. (Withdrawn) The method as claimed in claim 10, wherein in step a), a predetermined portion of the Bragg lattice layer has no Bragg lattices so as to form a phase conversion area thereto.

12. (Withdrawn) The method as claimed in claim 11, wherein a portion of the Bragg lattice is omitted to adjust an amount of phase conversion.

13. (Withdrawn) The method as claimed in claim 11, further comprising a step of forming a phase conversion electrode for applying a current to the phase conversion area.

14. (Withdrawn) The method as claimed in claim 11, further comprising a step of forming a phase conversion electrode for applying a voltage to the phase conversion area.

15. (Withdrawn) A method for manufacturing a gain-clamped semiconductor optical amplifier having a horizontal lasing structure, the method comprising the steps of:

- a) forming a gain material layer and a second conductive lower clad layer on a first conductive semiconductor substrate;
- b) forming a mask pattern on the second conductive lower clad layer of a predetermined gain layer forming area, forming a gain layer having a mesa structure through a selective etching process using the mask pattern as an etching mask, and forming an etching groove in the first conductive semiconductor substrate corresponding to a side wall of the gain layer;
- c) forming a current-blocking layer on the etching groove;
- d) forming a light waveguide layer including a material having a refractive index higher than that of the first conductive semiconductor substrate, on the current-blocking layer;
- e) forming a Bragg lattice layer on the light waveguide layer;
- f) forming a second conductive upper clad layer on an entire surface of the Bragg lattice layer and the gain layer; and
- g) forming an electrode on the second conductive upper clad layer for supplying current to the gain layer.

16. (Withdrawn) The method as claimed in claim 15, wherein, in step e), a phase conversion area is performed from a predetermined area of the Bragg lattice layer that does not have Bragg lattices.

17. (Withdrawn) The method as claimed in claim 15, further comprising a step of forming a phase conversion electrode for applying a current to the phase conversion area.

18. (Withdrawn) The method as claimed in claim 15, further comprising a step of forming a phase conversion electrode for applying a voltage to the phase conversion area.

19. (Withdrawn) The method as claimed in claim 15, wherein a gap between the gain layer and the light waveguide layer is substantially within $2\mu m$.

20. (Withdrawn) The method as claimed in claim 15, wherein a gap between the gain layer and the light waveguide layer is approximately $2\mu m$.